REMARKS

Claims 7-18 are currently pending in the application.

Reconsideration of the present application and allowance of the pending claims as

amended is respectfully requested in view of the following remarks.

Amendments

Claims 7 and 13 have been amended to specify that the feed gas mixture is fed into a

plurality of catalytic partial oxidation reactors disposed in a shell parallel to and spaced from one

another such that each is offset from another. Support for these amendments can be found in the

specification at least at page 10, line 23 to page 12, line 23.

Non-obviousness

The Office Action has rejected claims 7-18 under 35 U.S.C. 103(a) as obvious over U.S.

Patent No. 6,221,280 to Anumakonda et al. (hereinafter "Anumakonda") in view of U.S. Patent

Publication No. 2002/0041986 to Wojtowicz et al. (hereinafter "Wojtowicz"), in further view of

U.S. Patent No. 4,331,451 to Isogaya et al. (hereinafter "Isogaya"), and in further view of U.S.

Patent Publication No. 2002/0114747 to Marchand et al. (hereinafter "Marchand"). The Office

Action states that it would have been obvious to one of ordinary skill in the art, at the time of the

Applicants' invention, to combine Anumakonda, Wojtowicz, and Isogaya to provide heat from

an oxidation reaction to an inlet stream in order to prevent the deposition of carbon on a catalyst

bed. In addition, the Office Action states that Marchand makes it obvious to one of ordinary

skill in the art, at the time of the Applicants' invention, to provide a closed vessel where at least

one passage of a heat exchanger extends through a portion of the reaction chamber of

Anumakonda in order to use the heat supplied by the exothermic oxidation for other parts of the

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reaction. The rejections are respectfully traversed as applied to the claims as amended in view of

the following remarks.

Applicant's Claims

Claim 7, from which claims 8-12 depend, describes a method for catalytic partial

oxidation of hydrocarbon fuel comprising feeding a feed gas into plurality of catalytic partial

oxidation reactors disposed in a shell parallel to and spaced from one another such that each is

offset from another, reacting the feed gas to convert it to an exit gas mixture of hydrogen and

carbon monoxide, and passing a heat exchange fluid past the catalytic partial oxidation reactors

with the heat exchange fluid flowing in the same direction of reactant flow in the reactors such

that heat from partial oxidation in the reactors transfers to the heat exchange fluid. Claim 13,

from which claims 14-18 depend, describes a method for producing electric power which

comprises steps similar to the steps of claim 7 and additionally comprises directing the exit gas

to a solid oxide fuel cell system. By having the plurality of catalytic partial oxidation reactors

disposed in a shell parallel to and spaced from one another such that each is offset from another,

heat produced by the catalytic oxidation reactions is distributed along the shell for more efficient

heat transfer (See page 12, lines 6-23). In addition, by passing a heat exchange fluid past the

catalytic partial oxidation reactor in the same direction of reactant flow, the feed gas mixture in

the precatalyst zone can be kept cool and the postcatalyst zone can be kept hot (See page 11, line

20 to page 12, line 1).

The Cited References

Anumakonda discloses an apparatus for catalytic partial oxidation of hydrocarbons. As

admitted by the Examiner, Anumakonda does not teach a method comprising passing a heat

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exchange fluid past a plurality of catalytic partial oxidation reactors in the same direction of

reactant flow such that heat from the reactor transfers to the heat exchange fluid. Anumakonda

also does not disclose a plurality of catalytic partial oxidation reactors disposed in a shell parallel

to and spaced from one another such that each is offset from another.

Wojtowicz discloses a method for producing a hydrogen-rich gas from a

hydrocarbonaceous material by (1) pyrolysis of the hydrocarbonaceous material to produce

carbon-rich residue and hydrogen gas and (2) combusting a portion of the carbon-rich residue.

Isogaya discloses a process for catalytic gasification of heavy distillates, where the inlet

temperature must be higher than 500°C. As admitted by the Examiner, this disclosure suggests

that the inlet temperature should be maintained at a high enough temperature to prevent carbon

deposition.

Marchand discloses a steam reforming system comprising a steam reformer which

converts a fuel into a reformate stream to be fed into a shift reactor. The shift reactor can be

integrated with an absorbent bed to form an integrated reactor. Heat transfer passages extend

through the reactor bed so that heat may be transferred from the shift reactor and the absorbent

bed to a coolant. The coolant inlet 730 is proximate the reformer outlet 726 and the coolant

outlet 732 is proximate the reformate inlet 706. Thus, the coolant travels in a direction opposite

the direction of the reformate flow. As a result, the downstream end of the bed is significantly

cooler than the front portion. Paragraphs [0156]-[0163].

No Prima Facie Obviousness

According to M.P.E.P. §2142, three basic criteria must be met to establish a prima facie

case of obviousness. First, there must be some suggestion or modification, either in the

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references themselves or the knowledge generally available to one of ordinary skill in the art to

modify the reference or to combine reference teachings. Second, there must be a reasonable

expectation of success. Third, the prior art reference (or references when combined) must teach

or suggest all of the claim limitations. The teaching or suggestion to make the claim

combination and the reasonable expectation of success must both be found in the prior art, and

not based on Applicants' disclosure. In re Vaeck, 947 F.2d 488 20 U.S.P.Q. F.2d 1438 (Fed. Cir.

1991).

Applicants respectfully submit that Anumakonda, Wojtowicz, Isogaya, and Marchand do

not establish a prima facie case of obviousness against claims 7 and 13 of this application

because none of the prior art references, alone or in combination, teach or suggest all of the

claim limitations. As noted above, Anumakonda does not disclose a plurality of catalytic partial

oxidation reactors disposed in a shell parallel to and spaced from one another along the direction

of feed gas mixture flow. Nor does Anumakonda disclose passing a heat exchange fluid past a

plurality of catalytic partial oxidation reactors in the same direction of reactant flow such that

heat from the reactor transfers to the heat exchange fluid. Nothing in Wojtowicz, Isogaya, or

Marchand, alone or in combination, supplements the deficiencies of the teachings of

Anumakonda.

Furthermore, Isogaya teaches away from passing a heat exchange fluid past a plurality of

catalytic partial oxidation reactors in the same direction of reactant flow, which keeps the feed

gas mixture in the precatalyst zone cool. In particular, Isogaya teaches that the inlet should be

maintained at a high temperate to prevent carbon deposition. Likewise, Marchand teaches away

from passing a heat exchange fluid past a plurality of catalytic partial oxidation reactors in the

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same direction of reactant flow because Marchand discloses cooling the downstream portion of

the reactor bed with a coolant flowing in the direction opposite the reactant flow so that a higher

temperature results in the upstream portion of the bed. A prior art reference that teaches away

from the claimed invention is a significant factor to be considered in determining obviousness

and does not establish a prima facie case of obviousness. M.P.E.P § 2145; M.P.E.P § 2143; In re

Fine, 873 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988).

Therefore, a prima facie case of obviousness has not been established and the Applicants

claims are novel and nonobvious.

In view of the present response to Office Action, Applicant respectfully requests that a

timely Notice of Allowance be issued in this case. If there are any issues which can be resolved

by a telephone conference or an examiner's amendment, the Examiner is invited to telephone the

attorney at (404) 853-8036.

Respectfully submitted,

Her In

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